

200208149-1

10/655,053

IN THE CLAIMS:

The status and content of each claim follows:

1. (currently amended) An ink delivery regulation apparatus, comprising:
an ink chamber configured to contain a quantity of ink;
a support configured to be ~~positioned within an~~ coupled to said ink chamber; and
a resilient deflection member coupled to said support, said resilient deflection member
extending into said ink chamber and occupying a volume thereof, said resilient deflection
member being configured to resiliently deflect ~~from~~ between a generally concave shape ~~[[to]]~~
and a generally convex shape in response to a change in ~~said~~ a negative pressure in said ink
exterior to said resilient deflection member.
2. (original) The apparatus of claim 1, wherein said support is configured to
sealingly engage said ink chamber.
3. (currently amended) The apparatus of ~~claim 2~~ claim 1, wherein said resilient
deflection member comprises a number of pressure tuned panels disposed at angles with
respect to each other ~~is configured to contain an ink in said ink chamber.~~
4. (currently amended) The apparatus of ~~claim 1~~ claim 3, wherein said resilient
deflection member comprises first, second, and third pressure tuned panels ~~portions.~~

200208149-1

10/655,053

5. (original) The apparatus of claim 4, wherein said second panel is coupled to said support, said second panel being initially at a first angle relative to said first panel, at a second angle relative to said support, and at a third angle relative to said third panel.

6. (original) The apparatus of claim 1, wherein said deflection member comprises an elastomeric material.

7. (original) The apparatus of claim 6, where said elastomeric material comprises EPDM/Butyl.

8. (currently amended) The apparatus of ~~claim 9~~ claim 1, wherein said resilient deflection member is of substantially uniform thickness.

9. (currently amended) An ink delivery apparatus, comprising:
an ink chamber; and
a pressure regulation member having a support configured to be ~~positioned within~~
coupled to said ink chamber and a resilient deflection member coupled to extending from said
support and into said ink chamber occupying a volume thereof, said resilient deflection
member being configured to resiliently deflect ~~from~~ between a generally concave shape ~~[[to]]~~
and a generally convex shape in response to a change in said a negative pressure in said ink
chamber exterior to said resilient deflection member.

10. (currently amended) An ink delivery apparatus, comprising:
a plurality of ink chambers; and

200208149-1

10/655,053

~~The apparatus of claim 9, further comprising a plurality of said pressure regulation members, each a pressure regulation member being attached to a support that is configured to be coupled to said ink chambers, each pressure regulation member configured to be positioned within an ink chamber and comprising a resilient deflection member, said resilient deflection member being configured to resiliently deflect between a generally concave shape and a generally convex shape in response to a change in negative pressure.~~

11. (original) The apparatus of claim 9, further comprising a plurality of ink chambers.

12. (currently amended) The apparatus of claim 11, further comprising a plurality of pressure regulation members associated with each of said chambers.

13. (original) The apparatus of claim 11, wherein said plurality of ink chambers is configured to contain a plurality of differently colored inks.

14. (withdrawn) The apparatus of claim 9, wherein said apparatus comprises an off-axis ink supply.

15. (withdrawn) The apparatus of claim 9, wherein said apparatus comprises an on-axis ink supply.

16. (original) The apparatus of claim 9, further comprising a fitment associated with said ink chamber.

200208149-1

10/655,053

17. (withdrawn) The apparatus of claim 16, wherein said fitment further comprises a fluid interconnect.

18. (withdrawn) The apparatus of claim 17, wherein said fluid interconnect is configured to fluidly couple a print head and said chamber.

19. (withdrawn) The apparatus of claim 18, wherein said fluid interconnect comprises foam and a screen.

20. (withdrawn) The apparatus of claim 18, wherein said fluid interconnect comprises a septum.

21. (withdrawn) The apparatus of claim 18, further comprising a second fluid interconnect.

22. (withdrawn) The apparatus of claim 21, wherein said second fluid interconnect is configured to transmit ink to said chamber and further comprising a plug disposed in said second fluid interconnect.

23. (currently amended) The apparatus of ~~claim 18~~ claim 16, wherein said fitment is configured to couple with a print head.

200208149-1

10/655,053

24. (original) The apparatus of claim 16, further comprising a bubble generator associated with said chamber.

25. (original) The apparatus of claim 24, wherein said bubble generator is configured to limit said negative pressure within said chamber to a pressure equivalent to about 6" of water column during an operational period of said apparatus.

26. (original) The apparatus of claim 25, wherein said bubble generator is disposed in said fitment.

27. (currently amended) An ink delivery apparatus, comprising:
a plurality of ink chambers; and
an integral pressure regulation assembly having a plurality of pressure regulation members corresponding to said plurality of ink chambers, said assembly being configured to couple to said plurality of ink chambers:

wherein each pressure regulation member is configured to be positioned within each one of said plurality of ink chambers and includes ~~a support and~~ a resilient deflection member ~~coupled to said support~~, said resilient deflection member being configured to resiliently deflect ~~from between~~ a generally concave shape ~~[[to]]~~ and a generally convex shape in response to a change in ~~said~~ negative pressure.

28-29. (cancelled)

200208149-1

10/655,053

30. (currently amended) The apparatus of ~~claim 29~~ claim 27, wherein said plurality of ink chambers is configured to contain a plurality of differently colored inks.
31. (withdrawn) The apparatus of claim 30, wherein said apparatus comprises an off-axis ink supply.
32. (withdrawn) The apparatus of claim 27, wherein said apparatus comprises an on-axis ink supply.
33. (original) The apparatus of claim 27, further comprising a fitment associated with said ink chamber.
34. (withdrawn) The apparatus of claim 33, wherein said fitment further comprises a fluid interconnect.
35. (withdrawn) The apparatus of claim 34, wherein said fluid interconnect is configured to fluidly couple a print head and said chamber.
36. (withdrawn) The apparatus of claim 35, wherein said fluid interconnect comprises foam and a screen.
37. (withdrawn) The apparatus or claim 35, wherein said fluid interconnect comprises a septum.

200208149-1

10/655,053

38. (withdrawn) The apparatus of claim 35, further comprising a second fluid interconnect.

39. (withdrawn) The apparatus of claim 38, wherein said second fluid interconnect is configured to transmit ink to said chamber and further comprising a plug disposed in said second fluid interconnect.

40. (original) The apparatus of claim 35, wherein said fitment is configured to couple with a print head.

41. (original) The apparatus of claim 33, further comprising a bubble generator associated with said chamber.

42. (original) The apparatus of claim 41, wherein said bubble generator is configured to limit said negative pressure within said chamber to a pressure equivalent to about 6" of water column during an operational period of said apparatus.

43. (original) The apparatus of claim 42, wherein said bubble generator is disposed in said fitment.

44. (currently amended) A printing device, comprising:
an ink chamber configured to contain a quantity of ink; and
a pressure regulation member having
a support ~~positioned within~~ coupled to said ink chamber;

200208149-1

10/655,053

a resilient deflection member ~~coupled to~~ extending from said support into said ink chamber and occupying a volume thereof, said resilient deflection member being configured to resiliently deflect ~~from~~ between a generally concave shape [[to]] and a generally convex shape in response to a change in said ~~a~~ negative pressure in said ink chamber exterior to said resilient deflection member;

a fitment coupled to said ink chamber;

a bubble generator in communication with said ink chamber;

a print head coupled to said ink chamber.

45. (currently amended) The device of claim 44, wherein said resilient deflection member comprises a number of pressure tuned panels disposed at angles to each other first, second, and third pressure tuned panel portions.

46. (currently amended) The device of claim 45, wherein said pressure tuned panels comprise first, second, and third pressure tuned panels, wherein said second panel is coupled to said support, said second panel being initially at a first angle relative to said first panel, at a second angle relative to said support, and at a third angle relative to said third panel.

47. (original) The device of claim 44, wherein said bubble generator is configured to provide a substantially constant pressure equivalent to about 6" of water column.

200208149-1

10/655,053

48. (original) The device of claim 47, wherein said range is substantially equivalent to pressures of between about 3" and 7" inches of water column.

49. (currently amended) The device of claim 44, further comprising a plurality of ink chambers.

50. (original) The device of claim 49, wherein said plurality of chambers comprises three chambers.

51. (currently amended) The device of claim 50, wherein said plurality of chambers ~~comprises~~ are configured to contain a plurality of differently colored inks, ~~each contained within one of each of said plurality of pressure tuned ink chambers.~~

52. (currently amended) The device of ~~claim 51~~ claim 44, further comprising a ~~wherein said fitment further comprises~~ comprising first and second fluid interconnects, said first fluid interconnect being configured to fluidly couple ~~[[a]]~~ said print head and said chamber, and said second fluid interconnect being configured to fluidly couple an ink supply and said chamber.

53. (withdrawn—currently amended) The device of ~~claim 51~~ claim 44, wherein said apparatus comprises an off-axis ink supply.

54. (withdrawn—currently amended) The device of ~~claim 51~~ claim 44, wherein said apparatus comprises an on-axis ink supply.

200208149-1

10/655,053

55. (currently amended) A method of delivering ink, comprising:
providing an ink chamber containing an ink and wherein is disposed a deflection member extending into said ink chamber and occupying a volume thereof;
establishing a negative pressure in said chamber exterior to said deflection member;
supplying said ink to print head;
regulating a level of said negative pressure within a pre-determined range during said supplying of said ink by resiliently deflecting said deflection member in response changes in said negative pressure.

56. (original) The method of claim 55, wherein said regulating step further comprises resiliently deflecting said deflection member between a generally concave shape to a generally convex shape.

57. (currently amended) The method of claim 55, further comprising providing a plurality of said ink chambers and a corresponding plurality of said deflection members, wherein ~~are disposed a plurality of said a deflection member is disposed members~~ in each of said chambers.

58. (original) The method of claim 57, wherein each of said plurality of said chambers is configured to contain a differently colored ink.

59. (original) The method of claim 55, further comprising using an internal pressure source.

200208149-1

10/655,053

60. (original) The method of claim 59, wherein said internal pressure source comprises a bubble generator.

61. (original) The method of claim 60, wherein said bubble generator is tuned to pressure equivalent to about 6" of water.

62. (original) The method of claim 55, wherein said step of establishing said negative pressure comprises applying a positive pressure to said deflection member during a filling step, and removing said positive pressure at an end of said filling step.

63. (original) The method of claim 55, wherein said step of establishing said negative pressure comprises removing a small amount of said ink.

64. (original) The method of claim 55, further comprising moving said ink chamber with said print head.

65. (currently amended) An ink delivery system, comprising:
containing means for containing a supply of ink for a print head;
means for establishing a negative pressure in said containing means; and
means for maintaining said negative pressure within a predetermined range, said
means for maintaining said negative pressure extending into and occupying a volume of said
means for containing a supply of ink and comprising flexible means for flexing in response to

200208149-1

10/655,053

changes in said negative pressure within said means for containing and exterior to said means for maintaining said negative pressure.

66. (original) The system of claim 65, further comprising means for monitoring said negative pressure.

67. (withdrawn) The system of claim 65, further comprising means for notifying a user of a sudden increase in said negative pressure that indicates said containing means is operationally empty.

68. (original) The system of claim 65, further comprising means for providing positive pressure in said containing means.

69. (new) The apparatus of claim 1, further comprising a pair of said resilient deflection members configured to be positioned in said ink chamber to regulate said negative pressure in said ink chamber.

70. (new) The apparatus of claim 1, further comprising multiple resilient deflection members that are integrated together and configured to be respectively positioned in a plurality of corresponding ink chambers.

71. (new) The apparatus of claim 1, wherein said deflection member is configured to change shape in response to a change in ambient conditions so as to maintain said negative pressure within predetermined limits.

200208149-1

10/655,053

72. (new) The apparatus of claim 12, wherein a plurality of pressure regulation members is associated with each of said ink chambers.

73. (new) An ink delivery regulation apparatus, comprising:
an ink chamber configured to contain a quantity of ink;
a support configured to be coupled to said ink chamber; and
a resilient deflection member coupled to said support, said resilient deflection member extending into said ink chamber, said resilient deflection member being configured to resiliently deflect in response to a change in a negative pressure in ink held between a side wall of said ink chamber and said resilient deflection member.